April-12-13 7:32:08 AM

| Item ID: Revision ID: | D3997-11 | | | Accept | *N900 | 1040 | 1100 |)* | Setup Star | * *N | S1* |
|-----------------------------------|-------------|---|--|-----------------------------|-------------|--------|--------------|---------------|----------------|------------------|----------------|
| Item Name: | Placard | | | | | | | | Stop | *N | S2* |
| Start Date: | 4/08/13 | Start Qty: 10.00 | *10* | • | Cust Item | 1D: | | | | | |
| Required Date | : 4/11/13 | Req'd Qty: 10.00 | *10* | | Customer: | | | | | | , |
| Reference: | | | ·· · - | | | | | . 1 | Run Star | 't *NI | D 4 + |
| Approvals: | Process Pla | an: MLJ | Date: 13-04- | \ <u></u> √ Tooling: | D | ate: | | _ | | 1/1 | K1 ^ |
| | QC: | - · · · · · · · · · · · · · · · · · · · | Date: | SPC (Y/N): | D | ate: | | | Stop | *N | R2* |
| Sequence ID/ Work Center I | D | Operation Description | | Set Up/ Run Hours | Tool ID | Tool # | Plan Code | Accept Qty | Reject Qty | Reject Number | Insp. Stamp |
| Draw Nbr | Rev | vision Nbr | | | | | | | | | |
| D3997 | A | | | | | | | | | | |
| 100 | | | | 0.00 | | | | | | | |
| *100* Purchasing | | Memo | | 0.00 | | | | | P. | 3-04-1 | 1 |
| Purchasing | | Issue P/O: Manufacture Possible Sup | as per Dwg D3997 plier:Studio Lettrage ase note required | 0.00 | | | | | | | |
| 110 | | Receive & Inspect for Da | mage & Mat'l Certs | 0.00 | | | | | (12) | | <i>(</i> ,) |
| *110* | | | | | | | | | 93/7 | 122 | (/0) |
| Packaging Packaging | | Memo | | 0.00 | | | | | - | | |
| 120 | · | QC6- Inspect dimensions | to drawing | 0.00 A | | | | <i></i> . | | | |
| *120* QC QC Ouality Control | | Мето | | ر _{هنگ} ان 0.00 | 13/04/22 | | | (410) | | <u>-</u> | |

| | | | | | | | | | | DQA: | Date | : |
|----------------------|----------|-------------|-------------|-----|-----------------------------|----------|----------|-------------------------|----------|--------------|---------------|--------------------|
| NCR: Y | es / No | | | | WORK ORDER NON- | COI | NFORI | MANCE / UPDATE | _ | | | · |
| | | | | | | | | | C | A Closed: | Date | : |
| Work Orde | ŕ: | | | | DISPOSITION | | | AGAINST | DEPA | ARTMENT | PROCESS | |
| | | | | | Rework | 7 | | Skid-tube Crosstube | | | Water Jet | Engineering |
| Part N | O. | | | | Scrap | 1 | | Machining Small Fab | | Pro | d. Eng. Coor. | Quality |
| | | | | | Use-as-is | | Thern | noforming Finishing | | Rec/Stor | e/Packaging | Other |
| NCR N | o | | | | Work Order Update |] | | Large Fab Composite | | | Supplier | |
| | | . , | , , | | | | | | | | , | |
| Root | | | | | iption of work order update | | nitial | Action | | Sign & | M - 25 - 41 | 061 |
| Cause | Date | Step | Qty | | or Non-conformance | Ch | ief Eng | Description | | Date | Verification | QC Inspector |
| oc/Data | | | | | | | | | | | | |
| quip/Tooling | _ | | | | | | | | | | | |
|)perator Material | | | | | | | | | | | | |
| etup | | | | | | | | | | | | |
| Other | 1 | | | | | | | | | | | - |
| rocess | - | | | | | | | | | | | |
| upplier | | | | | | | | | | | | |
| raining | 7 | İ | | | | | | | | | | |
| Inapproved | | | | | | | | | İ | | | |
| | | | | • | | FAUL | T CATE | GORY | | | | |
| Landir | ng Gear | | | | General | | | | | | | _ |
| | Bending | ; | | | Bend | | Grain | | | valized | | Pressure/Forced |
| | Centre 1 | Not Conce | ntric to | o/s | BOM/Route | | Hardwa | re | Щo | ver/Under | tolerance | Temperature/Cure |
| | Cracks | | | | Broken/Damaged | | Inspect | on Incomplete | ∐P | art incorrec | t _ | Weld |
| | Crushed | I/Crimped | | | Burrs | | Instruct | ions Incomplete/Unclear | ∐ P | art Lost/Mi | ssing | Wrong Stock Pulled |
| | Cuffs | | | | Contamination | | Mainte | | \vdash | art Moved | | |
| | Heat Tre | | | | Countersink | | Mislabe | eled | ⊢ | ositioned W | | , |
| | | on Strip in | Tube | L | Cut Too Short | | Misread | d | ∐P | ower Loss/S | Surge | Other |
| | Ripples | | | | Drill Holes | | Offset | | _ | | <u></u> | |
| | | Waves in I | | n | Drawing | <u> </u> | 4 | Calibration | _ | | | |
| | Turning | Sequence | | 1 | Finish | | Out of 9 | Sequence | | | | |

Outside Dimensions

Wave/Twist in Tube

Folio

Page 2

April-12-13 7:32:08 AM

Quality Control

Item ID: D3997-11 Accept *N900040100* Setup Start **Revision ID:** Stop Item Name: Placard *10* 4/08/13 **Start Qty: 10.00 Start Date: Cust Item ID:** Required Date: 4/11/13 Req'd Qty: 10.00 **Customer:** Reference: Run Date: **Process Plan: Approvals: Tooling:** Date: Stop QC: SPC (Y/N): Date: Date: Sequence ID/ Operation Tool ID Set Up/ Tool# Plan Reject Reject Accept Insp. **Work Center ID Description** Qty Qty Number Stamp **Run Hours** Code Identify as per dwg & Stock Location: 130 *130* Packaging 0.00 Memo Packaging 140 QC21- Final Inspection - Work Order Release 0.00 *140* QC 0.00 Memo

R (B-04-23

| NCR: Y | es | / No | | £ | | | WORK ORDER NON- | COI | NFORM | MANCE / UP | DATE | DQA: | | £ . |
|---|----|---|----------------------|------------|------|------|---|-----|--|--|---|---|--|---|
| Nork Ordo | ů. | | | | | | DISPOSITION | | | | AGAINST D | EPARTMENT | /PROCESS | |
| Work Orde Part N NCR N | o | | | | | | Rework Scrap Use-as-is Work Order Update | | Thern | Skid-tube Machining noforming Large Fab | Crosstube Small Fab Finishing Composite | _ | Water Jet od. Eng. Coor. re/Packaging Supplier | Engineering Quality Other |
| Root | 1 | | | | Desc | crip | tion of work order update | | Initial | Ac | tion | Sign & | | |
| Cause | 1 | Date | Step | Qty | | • | r Non-conformance | | nief Eng | Desc | ription | Date | Verification | QC Inspector |
| oc/Data quip/Tooling perator Material etup other rocess upplier raining | | | | | | | | | | | | | | |
| | | | | | | | F | AUI | LT CATE | GORY | | | | |
| Landir | | iear Bending Centre No Cracks | ot Concei | ntric to (| o/s | | General Bend BOM/Route Broken/Damaged | | - ' | ion Incomplete | [| Ovalized Over/Under Part Incorre | ct | Pressure/Forced Temperature/Cure Weld |
| | | Crushed/O Cuffs Heat Trea Inspection Ripples in | it n Strip in | Tube | | | Burrs Contamination Countersink Cut Too Short Drill Holes | | Instruct Mainte Mislabe Misread Offset | eled | Unclear | Part Lost/M Part Moved Positioned \ Power Loss/ | Wrong | Wrong Stock Pulled Other |
| | | Torque W Turning So Wave/Tw | aves in E equence | | n | | Drawing Finish Folio | | Out of 9 | Calibration Gequence Dimensions | | | | |

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

Picklist Print

*April-12-13 7:32:11 AM

Work Order ID: 99791

99791

Parent Item:

D3997-11

D3997-11

Parent Item Name: Placard

Start Date: 4/08/13

Required Date: 4/11/13

Start Qty: 10.00

Required Qty: 10.00

Comments:

IPP rev A 10.01.12 new issue Prelim EC verified by:DD

| Component Item ID/ | Replacement | Mfg/ | Bin | Primary | Last | Route | Unit of | Qty on | Qty per Kit | Total | Qty | Date | Status |
|--------------------|-------------|-----------|------|----------|----------|--------|---------|--------|-------------|-------|----------------|--------|--------|
| Item Name | Item ID | Purch | Item | Location | Location | Seq ID | Measure | Hand | | Qty | Issued | Issued | |
| D3997-11P | | Purchased | No | | | | Each | 0.0000 | | 10 | 1 | | |
| *D3997-11 | 1P* | | | | | | | | ** | | 143h | /20 | (10) |
| Placard | | | | | | | | | | / | ' () <i>[</i> | 2 | -{// |

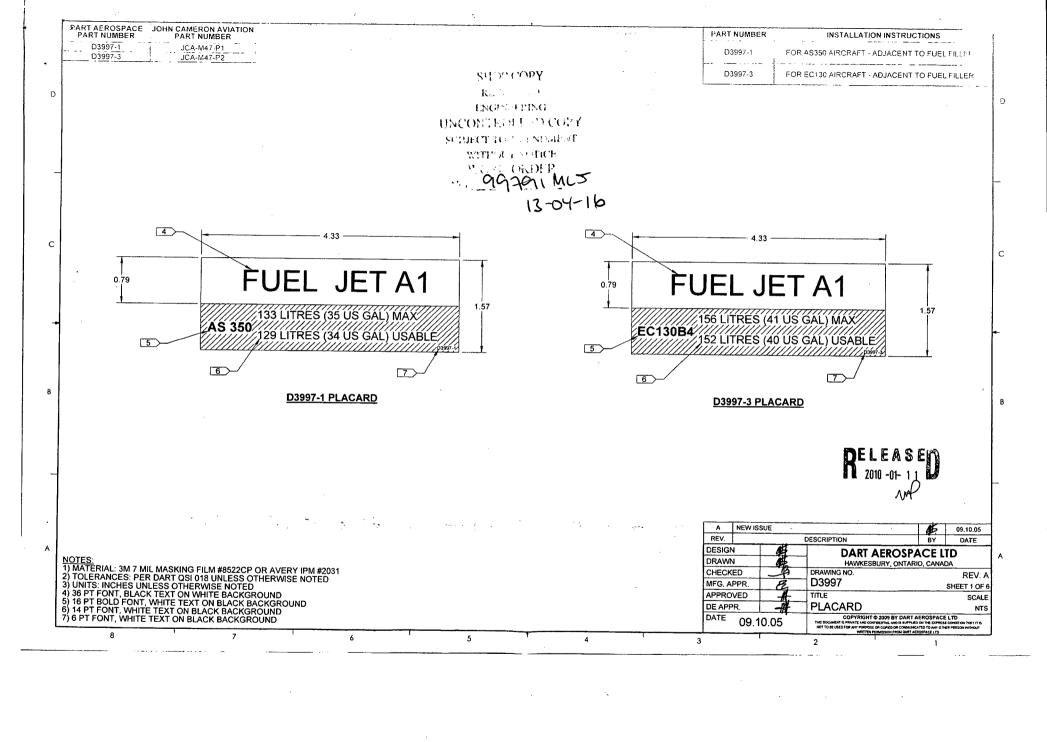
Page 1

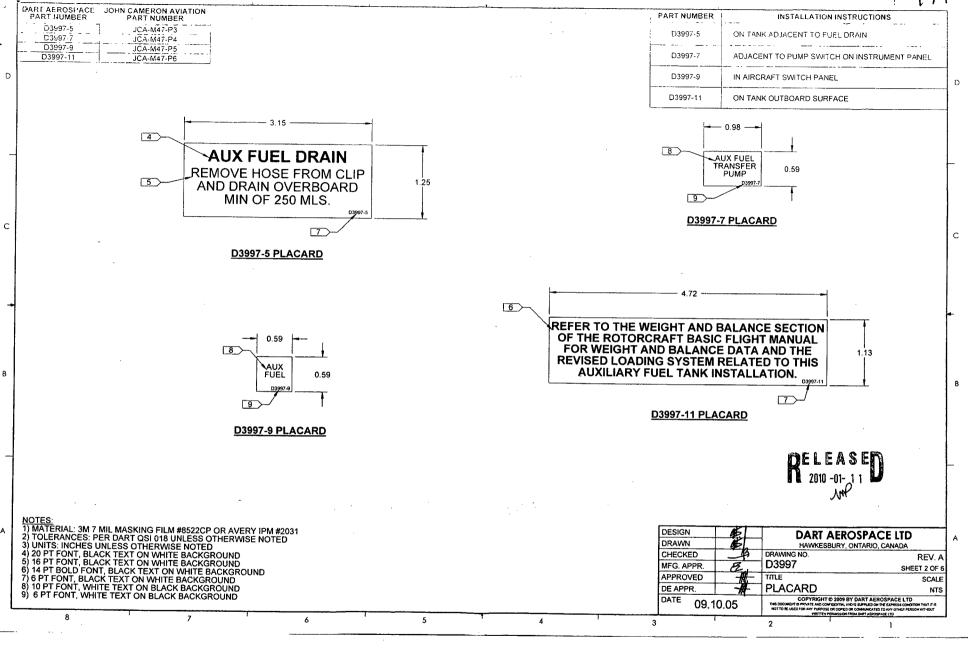
| | | | | | | | | | DQA: | Date: | |
|---|------|------|-----|--------|--|-----------|---|---|------------|---|---------------------------------|
| NCR: Yes | / No | | | | WORK ORDER NON-C | ONFORM | MANCE / UP | DATE | QA Closed: | Date: | • |
| Work Order: | | | | | DISPOSITION | | _ | AGAINST DE | PARTMENT | /PROCESS | _ |
| Part No. | | | | | Rework Scrap Use-as-is Work Order Update | | Skid-tube Machining noforming Large Fab | Crosstube Small Fab Finishing Composite | 1 | Water Jet d. Eng. Coor. re/Packaging Supplier | Engineering Quality Other |
| Root | | | | Descri | ption of work order update | Initial | Ac | tion | Sign & | | |
| Cause | Date | Step | Qty | | or Non-conformance | Chief Eng | Desc | ription | Date | Verification | QC Inspecto |
| Doc/Data Equip/Tooling Operator Material Setup Other Process Supplier | | | | | | | | | | | · |

| Landing | Gear | General | | | _ | _ |
|---------|------------------------------|----------------|---|---------------------------------|----------------------|--------------------|
| | Bending | Bend | Г | Grain | Ovalized | Pressure/Forced |
| | Centre Not Concentric to O/S | BOM/Route | Г | Hardware | Over/Under tolerance | Temperature/Cure |
| | Cracks | Broken/Damaged | | Inspection Incomplete | Part Incorrect | Weld |
| | Crushed/Crimped | Burrs | | Instructions Incomplete/Unclear | Part Lost/Missing | Wrong Stock Pulled |
| | Cuffs | Contamination | | Maintenance | Part Moved | |
| | Heat Treat | Countersink | | Mislabeled | Positioned Wrong | _ |
| | Inspection Strip in Tube | Cut Too Short | | Misread | Power Loss/Surge | Other |
| | Ripples in Bend | Drill Holes | Г | Offset | | |
| | Torque Waves in Extrusion | Drawing | | Out of Calibration | | , |
| | Turning Sequence | Finish | | Out of Sequence | | |
| | Wave/Twist in Tube | Folio | Γ | Outside Dimensions | | |

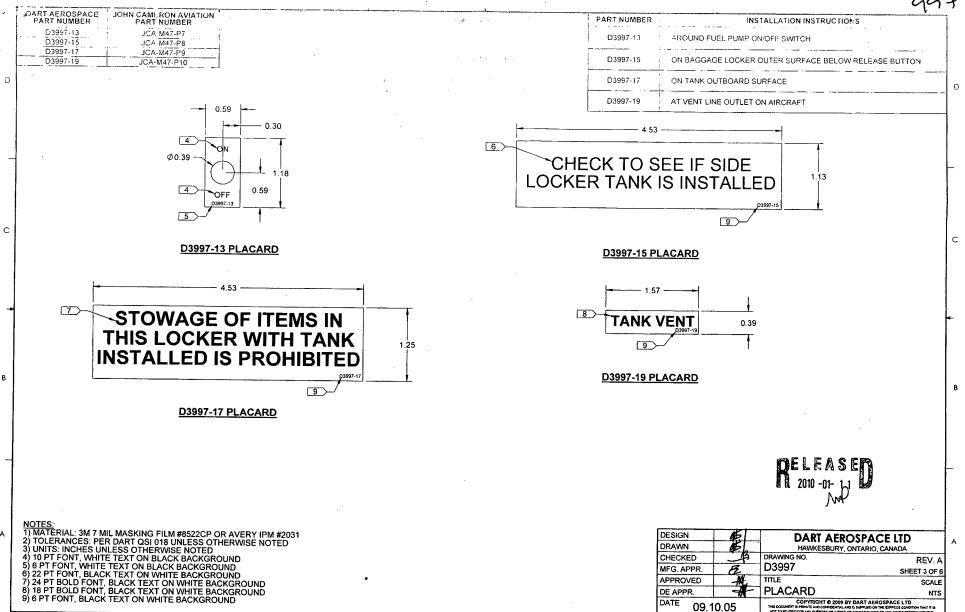
FAULT CATEGORY

Training Unapproved

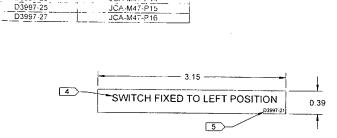








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DART AEROSPACE JOHN CAMERON AVIATION PART NUMBER PART NUMBER

JCA-M47-P13 JCA-M4: -P14

D3997-21

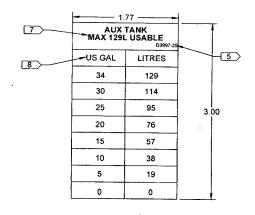
D3997-23

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С

В

D3997-21 PLACARD



D3997-25 PLACARD

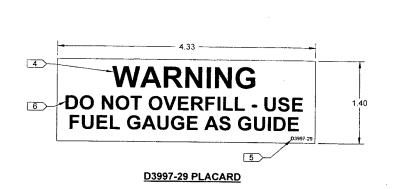
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|-------------------------|-------------|---|
| 5.05 | PART NUMBER | INSTALLATION INSTRUCTIONS |
| • •• | D3997-21 | ON AUX FUEL GAUGE SWITCH PLATE |
| | D3997-23 | ON AUX FUEL GAUGE |
| • | D3997-25 | NEXT TO AUX FUEL GAUGE (AS 350 ONLY) |
| 2.00 | D3997-27 | NEXT TO AUX FUEL GAUGE (EC 130 ONLY) |
| AUX FUEL | 0.39 | |
| 5 | 1 | |
| D3997-23 PLACARD | | |
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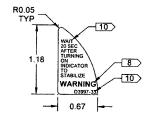
| | 1. | 77 | |
|---|----------|---------------------------|------|
| 7 | MAX 1521 | TANK USABLE D3997-2 | |
| 8 | US GAL | LITRES |] |
| | 40 | 152 | 1 |
| | 35 | 133 | 1 |
| | 30 | 114 | |
| | 25 | 95 | 3.33 |
| | 20 | 76 | |
| | 15 | 57 | |
| | 10 | 38 | |
| | 5 | 19 | |
| | 0 | 0 | |

D3997-27 PLACARD

| DESIGN | 4 | DART AEROS | PACE LTD |
|------------|-----------|--|--|
| DRAWN | 45 | HAWKESBURY, ONTA | |
| CHECKED | -49 | DRAWING NO. | REV. A |
| MFG. APPR. | E | D3997 | SHEET 4 OF 6 |
| APPROVED | -#- | TITLE | SCALE |
| DE APPR. | | PLACARD | NTS |
| DATE 09.1 | 0.05 | COPYRIGHT © 2009 BY DAR THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUP NOT TO BE USED FOR ANY PURPOSE OR COMED OF COME WITTEN PREMISSION FROM DAR | PLED ON THE EXPRESS CONDITION THAT IT IS RANCATED TO ANY OTHER PERSON WITHOUT |

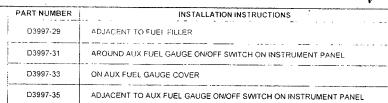
NOTES:
1) MATERIAL: 3M 7 MIL MASKING FILM #8522CP OR AVERY IPM #2031
2) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
3) UNITS: INCHES UNLESS OTHERWISE NOTED
4) 12 PT FONT, WHITE TEXT ON BLACK BACKGROUND
5) 6 PT FONT, WHITE TEXT ON BLACK BACKGROUND
6) 20 PT BOLD FONT, WHITE TEXT ON BLACK BACKGROUND
7) 10 PT BOLD FONT, WHITE TEXT ON BLACK BACKGROUND
8) 10 PT FONT, WHITE TEXT ON BLACK BACKGROUND

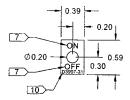




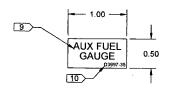
D3997-33 PLACARD

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D3997-31 PLACARD



D3997-35 PLACARD



| DESIGN | 45 | DART AEROS | PACE LTD |
|------------|------|--|---|
| DRAWN | 4 | HAWKESBURY, ONT. | |
| CHECKED | _# | DRAWING NO. | REV. A |
| MFG. APPR. | B | D3997 | SHEET 5 OF 6 |
| APPROVED | # | TITLE | SCALE |
| DE APPR. | # _ | ☐ PLACARD | NTS |
| DATE 09.1 | 0.05 | COPYRIGHT © 2009 BY IIA: THIS DOCUMENT IS PROVIDE AND CONFIDENTIAL AND IS SU NOT TO BE USED FOR ANY PURPOSE OR COPED OR COM- WRITTEN PERMISSION FROM DA | PPLED ON THE EXPRESS CONDITION THAT IT IS MAPPICATED TO ANY OTHER PERSON WITHOUT |

| NOTES: |
|---|
| 1) MATERIAL: 3M 7 MIL MASKING FILM #8522CP OR AVERY IPM #2031 |
| 2) TULERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED |
| 3) UNITS: INCHES UNLESS OTHERWISE NOTED |
| 4) 36 PT BOLD FONT, RED TEXT ON WHITE BACKGROUND |
| 5) 6 PT FONT, BLACK TEXT ON WHITE BACKGROUND |
| 6) 24 PT BOLD FONT, BLACK TEXT ON WHITE BACKGROUND |
| 7) 10 PT FONT, WHITE TEXT ON BLACK BACKGROUND |
| 8) 9 PT BOLD FONT, WHITE TEXT ON BLACK BACKGROUND |
| 9) 12 PT FONT, WHITE TEXT ON BLACK BACKGROUND |
| 10) 6 PT FONT, WHITE TEXT ON BLACK BACKGROUND |
| |

DART AEROSPACE PART NUMBER

D3997-29

D3997-31

D3997-33

D3997-35

JOHN CAMERON AVIATION PART NUMBER

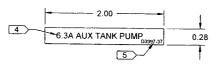
JCA M47-P18

JCA-M47-P19

JCA-M47-P20

JCA-M47-P17

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D3997-37 PLACARD

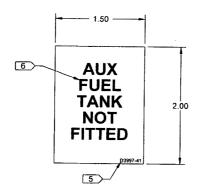
JOHN CAMERON AVIATION : PART NUMBER

JCA-M47-P23

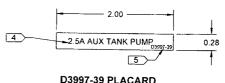
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JCA-M47 P21

JCA-W17 P22



D3997-41 PLACARD



PART NUMBER

03997-37

D3997-39

D3997-41

D3997-43

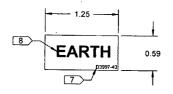
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ADJACENT TO CB INSTALL

ON TANK EARTH POINT

ON TANK ADJACENT TO FUEL FILLER

D3997-39 PLACARD



D3997-43 PLACARD



| DESIGN | 15 | DART AEROS | SPACELID |
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| DRAWN | 45 | HAWKESBURY, ON | |
| CHECKED | _# | DRAWING NO. | REV. A |
| MFG. APPR. | E | D3997 | SHEET 6 OF 6 |
| APPROVED | # | TITLE | SCALE |
| DE APPR. | W | PLACARD | NTS |
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|---|
| 2) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED |
| 3) UNITS: INCHES UNLESS OTHERWISE NOTED |
| 4) 10 PT FONT, WHITE TEXT ON BLACK BACKGROUND |
| 5) 6 PT FONT, WHITE TEXT ON BLACK BACKGROUND |
| 6) 20 PT BOLD FONT, WHITE TEXT ON BLACK BACKGROUND |
| 7) 6 PT FONT, BLACK TEXT ON WHITE BACKGROUND |
| 8) 20 PT BOLD FONT, BLACK TEXT ON WHITE BACKGROUND |

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DART AEROSPACE PART NUMBER

D3997-37

D3997 39 D3997-41

D3997-43

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Dart Aerospace Ltd. 1270 Aberdeen Street Hawkesbury, ON K6A 1K7

Tel: 613 632 9577 Fax: 613 632 1053

PURCHASE ORDER

Purchase Order ID PO19613

Purchase Order Date 4/17/2013 PO Print Date 4/18/2013

Page Number 2 of 2

Order From:

VC-STU001

STUDIO DE LETTRAGE 2001 210 MAIN WEST HAWKESBURY, ON K6A 2H6 CA

Contact Name

Vendor Phone

613 632 5449

Vendor Fax

613 632 9491

Vendor Account Nbr

Buyer

Brigitte Golden

Requisition Nbr

Tax Resale Nbr

10127-2607

Terms

Net 30

Currency

CAD

FOB

Destination-Collect

D3997-11F

Placard

4/19/2013

10.00 Yours ppd Each

\$7.5000

\$75.00

Special Inst:

AS PER DWG: D3997

Yes

REV: A

B99791

PO Total:

\$354.10

Change Date: 4/18/2013

No substitution or deviation without consent.

Certificate of Conformity or Material Certification required/- YES NO

Change Nbr:

2

40.

Dart Aerospace Ltd

1270 Aberdeen Hawkesbury, Ontario K6A 1K7

Studio de Lettrage 210 Main Street W Hawkesbury, Ontario K6A 2H6

INVOICE

Invoice No.:

19915

Date:

04/19/2013

Ship Date:

Page:

Re: Order No.

WO9726

Sold to:

Ship to:

Dart Aerospace Ltd

Hawkesbury, Ontario

| Busines | 1 | 82500 7651 RT | 0001 | | | | |
|-----------|------------|------------------|-------------|---|--|-----------------|----------------|
| Iten | No. | Unit | Quantity | Description | Tax | Unit Price | Amount |
| | | | 10 | STICKERS 3M CUT VINYL, 1 SIDE D2137P | Н | 2.500 | 25.00 |
| | | | 1 | LAYOUT | н | 50.000 | 50.00 |
| | | | | STICKERS 3M CUT VINYL, 1 SIDE D2258-200P LAYOUT | H | 0.791 | 7.91 |
| • | | | | STICKERS 3M CUT VINYL, 1 SIDE | H | 50.000 2.500 | 50.00 25.00 |
| | | | 10 | D3997-13P LAYOUT STICKERS 3M CU) VINYL, 1 SIDE | н | 50.000 | 50.00 |
| | | | | D3997-11P LAYOUT | Н | 2.500 | 25.00 |
| | | 5,31 | ज्याता - | H - HST 13% | n | 50.000 | 50.00 |
| | | | | HST | | | 36.78 |
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| Shipped | | Tracking N | | | | 10 mg/m | |
| Commer | it: | | | | di di di di di di di di di di di di di d | Table Arra | 319.69 |
| | [| | | | | Total Amount | 319.69 |
| Sold By: | | | | | | | - <u> </u> |

| ****Certificate of Conformity**** | | | | |
|---|--|--|--|--|
| Customer: | | | | |
| Studio hotrage | | | | |
| Purchase Order #: Packing Slip #: Palt #: Serial #: | | | | |
| Description: D21378 D238 Quantity: | | | | |
| 22/34/1220 | | | | |
| D3997-13: 83997-11P) 10 EACH. | | | | |
| | | | | |
| We hereby certify that: | | | | |
| The above the listed items were manufactured, repaired and/or inspected in | | | | |
| accordance with applicable drawings and/or specifications; | | | | |
| All work was accomplished in accordance with the Dart Aerospace Purchase Order: | | | | |
| Results of all inspections, chemical or physical tests, as well as other evidence, which shows the acceptability of raw materials, parts and/or assembly components are on file and available for inspection at any time. | | | | |
| Authority: | | | | |
| 3m | | | | |
| APPROVAL: Karn Stellit R.E DATE: | | | | |
| Signature Com VE. Mon | | | | |
| Title: Project Coordinator HORI 19,2013. | | | | |

•



Product & Instruction Bulletin 8522

Release I, Effective September 2008 See Bulletin Change Summary and end of Bulletin This Bulletin now includes Instruction Bulletin 4.23

Scotchcal[™] Changeable Opaque Imaging Media

8522

Product Description

Recommended Types of Graphics and End Uses

For Thermal Inkjet Printing

This durable, 7 mil, opaque, changeable film is optimized for use with selected thermal inkjet printers and inks. Ink dries quickly on the film. When overlaminated, it is warranted for medium term, outdoor weatherable graphics, and long term indoor graphics.

When constructed and used as described in this Bulletin, these types of graphics and end uses may be warranted by the 3M ™ MCS ™ Warranty. Please read the entire Bulletin for details.

- First surface images (the image is on top of the film) for opaque posters and signs, including:
 - Graphics for vans, personal vehicles, trucks and buses
 - Novelty posters
 - Retail and point-of-purchase displays
 - Information graphics such as maps and directories
 - Entertainment promotions in museums, zoos, parks, theatres, sports venues
 - Education and presentation graphics
 - Legal and courtroom exhibits
- For flat or simple curved surfaces, with or without rivets, used in vertical (± 10°)
 applications

Limitations of End Uses

3M specifically does not recommend or warrant the following uses, but please contact us to discuss your needs or recommend other products.

Unsuitable End Uses for This Product

- Not for electronically cut individual letters and numbers
- · Fleet applications in areas that use salt for winter road maintenance
- Application to non-warranted substrates, including wallboard
- Applications subjected to gasoline vapors or spills
- · Application to corrugated or highly irregular surfaces or sharply raised areas
- Graphics applied to stainless steel, including stainless steel vehicles
- On flat surfaces with rivets, tenting of 4 to 10 mm around rivets may be expected; rivets may be cut around to eliminate tenting.
- Graphics made for automotive Original Equipment Manufacturers (OEM); contact 3M Automotive Division at 1-800-328-1684 for alternatives.

About Water-Based Inkjet Technology

Standard inkjet technology is water based. Water-based chemistry is susceptible to the extremes of heat and humidity. This is a factor in most product constructions on the market. Read the Fabrication, Shelf Life and Storage sections in this Bulletin. Staying in the middle of these ranges always provides optimum performance.

Compatible Products

3M Graphic Materials

For complete details about graphic construction options, recommended uses and durability, refer to the Product Bulletin for the base film or substrate (media) you are using. See **3M Related Literature** at the end of this Bulletin.

This Bulletin provides details about the base film and construction options and warranty. Additional specific information about compatible products can be found in the Product and Instruction Bulletins listed in **3M Related Literature** at the end of this bulletin.

3M Graphic Materials

For complete details about graphic construction options, recommended uses and durability, refer to the Product Bulletin for the base film or substrate (media) you are using. See **3M Related Literature** at the end of this Bulletin.

Film

3M™ Scotchcal™ Opaque Imaging Media 8522

Overlaminate

- 3M™ Scotchcal™ Luster Overlaminate 8519
- 3M™ Scotchcal™ Matte Overlaminate 8520

Printers and Inks

| HP Designjet Printers | HP Inks | | |
|---|--|--|--|
| 2500CP and 2000CP 2800CP and 3800CP 3500CP and 3000CP HP Designjet 5000 and 5500 | Designjet CP Ink System UV (pigment-based) Designjet CP Inkjet System (imaging ink) | | |
| • Z6100 | HP 91 Vivera Ink System | | |

| Epson Printers | Epson Inks |
|--------------------------|---------------|
| Stylus Pro 9500 | Archival Inks |
| Stylus Pro 10000 printer | |
| Stylus Pro 10600 printer | |

Characteristics

These are typical values for unprocessed product; processing may change the values. Contact your 3M representative for a custom specification.

| Characteristic | Description |
|----------------------------------|---|
| Media | 7 mil, white, opaque graphic film |
| Liner | Low-slippage, lay flat paper |
| Adhesive | Changeable, pressure sensitive |
| Thickness | Media with adhesive: 7.5 to 8 mil (nominal) |
| Warranted application substrates | See next page. |
| Application surfaces | Flat or simple curved surfaces, with or without rivets, used in vertical (± 10°) applications (no corrugations) |
| Application temperature range | 28° to 110°F (-2° to 43°C) (air and surface) |
| Removable | For up to one year; see Warranty Information |

| Characteristic | Description | | | | |
|--|--|--|--|--|--|
| Warranted application substrates | Some substrates may "out-gas", resulting in tiny bubbles throughout the surface of the graphic. For maximum performance, be sure the substrate you select is properly cleaned and prepared as recommended by the manufacturer. See Instruction Bulletin 5.1 for additional information. | | | | |
| | Alodine (anodized aluminum) | | | | |
| | Automotive panels (automotive painted steel) | | | | |
| | Fruehauf (painted aluminum) | | | | |
| | FRP (fiberglass reinforced plywood) | | | | |
| | Glass | | | | |
| | Imron® (polyurethane-painted metal panel) | | | | |
| | Acrylic | | | | |
| | Sintra[™] board | | | | |
| | Note: Use on any other substrate is strictly on a graphics manufacturer and customer test and approve basis. Test for both adhesion and removal characteristics. The plasticizer in some banner materials may migrate. This may cause the edge of the graphic to peel or lift off of the banner. For optimum performance, follow the guidelines in the section, Creating A Laminated Overlap, on page 4. | | | | |

Warranty Information

The warranty given in the Product Bulletin that is current at the time you purchased the film is the one that 3M will honor. The warranties in the following table(s), given in years, are for finished graphics exposed in a vertical exposure in the United States except the Desert Southwest. See the warranty sections following this table for additional information.

3M[™] MCS[™] Warranty Durability for Finished Graphics

| Construction (film and | HP Printers & Inks | | Epson Printers & Inks | | Removal |
|--|--------------------|---------|-----------------------|---------|-----------------------------|
| overlaminate on warranted substrate | Outdoor | Indoor | Outdoor | Indoor | |
| 8522/8519 | 3 years | 5 years | 2 years | 5 years | 1 year without |
| 8522/8520 | | | | | chemical strippers or tools |

Warranty and Limited Remedy

The following is made in lieu of all other express or implied warranties, including any implied warranty of **merchantability** or fitness for a particular purpose or implied warranty arising out of a course of dealing, custom or usage of trade: all 3M products are warranted to be free of defects in materials and manufacture at the time of shipment and to meet the specifications stated in this Product Bulletin. 3M will replace or refund the price of any 3M materials that do not meet this warranty within the specified time periods. These remedies are exclusive. In no case shall 3M be liable for any direct, indirect, or consequential damages, including any labor or non-3M materials charges.

See the Graphics Market Center Warranty Brochure, which gives the terms, additional limitations of the warranty, if any, and limitations of liability.

Graphic Construction Options

Opaque Graphics

Opaque graphics made with imaging media 8522 require an overlaminate and an opaque substrate.

Overlaminate 8519, 8520 Adhesive on bottom Imaging Media 8522 Image on top; adhesive on bottom Opaque Substrate

Fabrication

Different combinations of shop temperature and humidity can affect the handling of the media, the protective finish and the printed graphic. For optimum performance, use the *middle* of each of these ranges whenever possible.

Shop Temperature

Acceptable: 60° to 95°F (15° to 35°C) Optimum: 65° to 73°F (18° to 23°C)

Shop Humidity

Acceptable: 20% to 80% Optimum: 45% to 60%

Condition the Media Before Use

These steps are especially important if you are operating outside the conditions recommended under Fabrication, above.

- Leave the media in its original packaging until you are ready to condition and use it.
- The day before you need it, remove the media from the box and remove the plastic.
- Condition the media for 24 hours in the same environment as the printer.

Printer Settings for Optimum Quality

Refer to your Hewlett Packard printer manual for detailed operating instructions.

The quality of a printed image depends on a combination of factors: correct media selection, printing software and raster imaging processor (RIP), shop conditions, etc.

The printers qualified to use this media have print mode options that are programmed specifically for these media. Current charts that show the various modes and printing dpi, and the quality results you can expect are available at www.hp.com under the website's support section. We recommend that you print the same image at all of these settings to determine acceptable print and productivity results.

The highest quality settings are usually desirable for backlit applications.

The correct media selection makes most other necessary adjustments to the printer.

- For the HP DesignJet CP 2000 or 3000 series printers, select the Opaque Vinyl UV setting.
- For the HP Designjet 5000 series printers, select the **3M Changeable UV** setting or the HP **Durable Gloss UV** or HP **Colorfast Vinyl** setting.
- For the Z series printers, refer to HP's website or printer manuals.

Note: The HP printer settings lay down less ink per pass, which results in better ink absorption and quicker drying times.

- For the HP DesignJet CP 2000 or 3000 series printers, select the Opaque Vinyl UV setting.
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Note: The HP printer settings lay down less ink per pass, which results in better ink absorption and quicker drying times.

Drying Guidelines

Usually, the media can be laminated within 10 minutes after printing. However, especially in high humidity conditions, we recommend waiting 15 to 30 minutes before laminating.

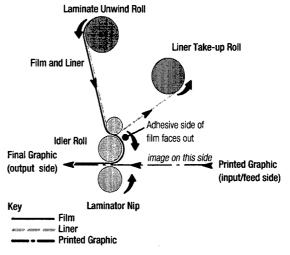
Use care when handling graphics that have not been laminated to avoid scratching and abrasion

Graphics made with this media and ink combination typically may be wound directly on a take-up roll after printing.

Whether or not you want a warranted graphic, an overlaminate is recommended to enhance durability, especially in outdoor applications.

Overlaminate

FIGURE 1 Typical Laminator Thread-up



Creating a Laminated Overlap

Creating a laminated overlap helps ensure that the graphic does not peel or lift away from certain banner materials that may be subject to plasticizer migration. This method may also be used for flat, rigid or flexible sign applications.

- 1. Print the graphic as usual.
- 2. On all sides of the graphic, score *the film only* to the correct, final graphic dimension *without cutting through the liner*.

Weed away the excess film, leaving the bare liner exposed around the graphic. See FIGURE 2.

FIGURE 2 Trim and Weed Film Margin Only



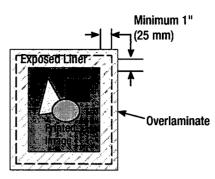




Weed Margin

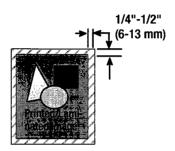
3. Laminate the graphic as usual (see page 5), making sure that at least one inch of the bare liner is covered by the laminate. See FIGURE 3.

FIGURE 3 Apply Overlaminate



 Trim the graphic to its final dimensions, making sure to leave a margin of 1/4 to 1/2 inch (6 to 13 mm) laminated liner on all sides that require the laminate overlap. See FIGURE 4.

FIGURE 4
Trim, leaving a margin of overlaminated Liner



Mounting the Final Graphic

Mounting Methods

Use the following guide to determine if you should mount the final graphic on its intended sign substrate by hand or with a laminator.

Hand

- Thick or rigid graphics
- · Removable or positionable adhesive
- · Complex sign mounting surface
- · Small graphic mounted by 1 person
- Medium to large graphic mounted with 2 people
- · Fleet graphics applied directly to the vehicle

Laminator

- · Thin or flimsy graphics
- · Aggressive mounting adhesive
- · Flat sign mounting surface
- Medium to large graphic mounted by 1 person

Procedure

- Be sure the temperature of the air, graphic and surface to which you mount the graphic is 45° to 95°F (7° to 35°C).
- 2. Be sure the substrate is clean and dry. Contaminants prevent good adhesion.
- If your substrate is susceptible to outgassing, treat it according to the manufacturer's recommendations before mounting the graphic. This avoids bubbling that may be unacceptable.
- 4. For hand lamination only: Put a low friction paper sleeve over a hard plastic squeegee. The sleeve helps prevent scratching the graphic surface.
- Position the graphic on the substrate, leaving about a 2 inch (50 mm) margin all around the graphic.
- 6. Apply a 2 inch (50 mm) wide piece of masking tape across the top edge of the graphic.
- 7. Flip the graphic over. You can roll the graphic for easier handling, if desired.

- 8. Flip the graphic over. You can roll the graphic for easier handling, if desired.
- Strip back some of the liner, starting at the taped edge. Do not allow the adhesive to touch the substrate yet.
- 10. For hand lamination only:
 - a. Hold the graphic up with one hand and use the other hand to hold the squeegee.
 - Starting in the middle of the taped edge of the graphic, use smooth, overlapping strokes to each side of the graphic.
 - Stop immediately if you notice some wrinkling. Lift the wrinkled area and reposition. Then gently squeegee the wrinkle to finish smoothing it.
 - d. Pull back some more liner and continue squeegeeing the graphic. To finish the graphic, trim the substrate to the desired size.
- 11. For a laminator only:
 - a. Position the taped edge of the graphic into the laminator nip.
 - b. Start the laminator.
 - c. As the graphic is pulled through the nip, continue pulling off the liner.
 - d. To finish the graphic, trim the substrate to the desired size.
- 12. After applying the graphic, resqueegee all edges firmly. Premature lifting of the graphic may occur if the edges are not adequately laminated.

End of Day Protocol

- Unthread the web from the printer and tape the roll closed at the center. It is not necessary to remove the roll from the printer.
- If the media will not be used for a few days, remove it from the printer and rewrap it. See Shelf Life, Storage and Shipping on page 4.

Care and Cleaning of Graphics

Avoid contact between the finished graphic and water or other liquids during production, handling, and application, especially before laminating.

Use a cleaner designed for high-quality painted surfaces. The cleaner must be wet, non-abrasive, without strong solvents, and have a pH value between 3 and 11 (neither strongly acidic nor strongly alkaline.)

Refer to 3M Instruction Bulletin 6.5 for general maintenance and cleaning information.

Removing Graphics

Always test the substrate for removal before applying the final graphic. Paint that has poor adhesion to the substrate may be pulled off when removing the film. Aged surfaces with oxidation or chalking may leave adhesive residue on the substrate after the film is removed.

If the substrate surface is appropriately sealed, just lift an edge of the graphic and peel it back at a 180 degree angle; lesser angles may leave adhesive residue. No heat or chemicals are required.

Health and Safety



When handling any chemical products, read the manufacturers' container labels and the Material Safety Data Sheets (MSDS) for important health, safety and environmental information. To obtain MSDS sheets for 3M products go to 3M.com/MSDS, or by mail or in case of an emergency, call 1-800-364-3577 or 1-651-737-6501.

When using any equipment, always follow the manufacturers' instructions for safe operation.

Shelf Life, Storage and Shipping

Shelf Life

Total shelf life: 1 year (processed, unprocessed or any combination thereof)

Storage Conditions

- New and partially used rolls. For optimum performance, use the middle of these ranges:
 - Original packaging, including plastic wrap to protect from contamination
 - Use an end plug and tape down the edge to prevent damage if the media is stored upright
 - Relative humidity of 20% to 80%
 - Temperature of 33° to 104°F (0° to 40°C)
 - Away from direct sunlight
- Bring the film to print room temperature before using
- Do not stack unprotected rolls or lay sharp or heavy objects on them.
- Do not lay sharp or heavy objects on unprotected rolls and do not stack them.

Shipping Finished Graphics

Flat, or rolled printed side out on 5 inch (13 cm) or larger core. This helps prevent the liner and, if used, the application tape from popping off.

3M Related Literature

Before starting any job, be sure you have the most recent product and instruction bulletins.

The information in 3M Product and Instruction Bulletins is subject to change. Current Bulletins are available at 3Mgraphics.com. The techniques described in these Bulletins are required when applying a 3M warranted graphic, but are also practical recommendations when using promotional materials for non-warranted graphics. Additional Bulletins may be needed as indicated in the 3M Related Literature section of other 3M components you use.

Bulletin types: PB = Product Bulletin; PB-IB = Product & Instruction Bulletin; IB = Instruction Bulletin

| Subject | Туре | Bulletin No. |
|---|----------------------|--------------|
| 3M™ Scotchcal™ Luster Overlaminate 8519 and 8520 | PB | 8519/8520 |
| Application, substrate selection, preparation and substrate-specifitechniques | c application IB | 5.1 |
| Application, general procedures for indoor and outdoor dry applica | ations IB | 5.5 |
| Storage, handling, maintenance, removal | lВ | 6.5 |
| 3M Graphics Center Warranty Brochure go to ww | vw.3Mgraphics.com, W | arranties |

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Bulletin Change Summary

HP Designjet printer Z6100 and HP 91 Vivera ink systems have been added to the list of compatible printers and inks.

Instruction Bulletin 4.23 has been incorporated into this Bulletin, which is now called Product & Instruction Bulletin 8522.

3M™ Scotchcal™ Instant Dry Translucent Imaging Media 8544, which was shown in Instruction Bulletin 4.23, is obsolete. A backlit graphic option is no longer available.

3M

Commercial Graphics Division

3M Center, Building 220-12E-04 PO Box 33220 St. Paul, MN 55144-3220 USA General Info. 1-800-374-6772 Technical Info. 1-800-328-3908 3M Canada

P.O. Box 5757 London, Ontario Canada N6A 4T1 1-800-265-1840 Fax 519-452-6245 3M México, S.A. de C.V

Av. Santa Fe No. 55 Col. Santa Fe, Del. Alvaro Obregón México, D.F. 01210 52-55-52-70-04-00 Fax 52-55-52-70-22-77 3M Puerto Rico, Inc.

Puerto Rico Industrial Park P.O. Box 100 Carolina, PR 00986-0100 787-620-3000 Fax 787-750-3035

Fax 1-651-736-4233 www.3Mgraphics.com

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